

1 WHAT IS CLAIMED IS

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1. A semiconductor device, comprising:
 a mount substrate;
 a high-frequency transmission line provided on
 a top surface of said mount substrate;
10 a semiconductor chip mounted on said top
 surface of said mount substrate in a facedown state in
 electrical contact with said high-frequency transmission
 line, said semiconductor chip thereby having a bottom
 surface facing said top surface of said mount substrate;
15 and
 a depression formed on said top surface of
 said mount substrate.

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2. A semiconductor device as claimed in claim
1, wherein said semiconductor chip carries a projection
 on said bottom surface, said semiconductor chip being
25 mounted on said top surface of said mount substrate such

1 that said projection is accepted into said depression,
and wherein said depression has a depth set such that
said projection does not contact a surface of said
depression.

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3. A semiconductor device as claimed in claim
10 2, further comprising an interconnection structure on
said high-frequency transmission line, said
semiconductor chip being connected electrically and
mechanically to said high-frequency transmission line
via said interconnection structure, wherein said depth
15 of said depression is set such that said depth is equal
to or larger than a height of said projection from which
a height of said interconnection structure is
subtracted.

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4. A semiconductor device as claimed in claim
3, wherein said interconnection structure includes a
25 solder bump.

1 5. A semiconductor device as claimed in claim
2, wherein said semiconductor chip carries a coplanar
transmission line on said bottom surface thereof, and
wherein said projection is an air bridge structure
5 forming a part of said coplanar transmission line.

10 6. A semiconductor device as claimed in claim
1, wherein said depression forms a through-hole
penetrating through said mount substrate from said top
surface to a bottom surface opposite to said top
surface.

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7. A semiconductor device as claimed in claim
20 1, wherein said high-frequency transmission line is a
microstrip line including a ground layer, a dielectric
layer provided on said ground layer and a wiring layer
provided on said dielectric layer.

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1 8. A semiconductor device as claimed in claim
7, wherein said dielectric layer is formed of SiO_2 .

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9. A semiconductor device as claimed in claim
7, wherein said dielectric layer is formed of polyimide.

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10. A semiconductor device as claimed in
claim 1, wherein said substrate is formed of Si.

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11. A semiconductor device as claimed in
20 claim 1, wherein said substrate is formed of polyimide.

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12. A semiconductor device as claimed in

1 claim 1, wherein said depression is defined by a crystal
surface.

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13. A method of fabricating a semiconductor device comprising a mount substrate; a high-frequency transmission line provided on a top surface of said 10 mount substrate; a semiconductor chip mounted on said top surface of said mount substrate in a facedown state in electrical contact with said high-frequency transmission line, said semiconductor chip thereby having a bottom surface facing said top surface of said 15 mount substrate; and a depression formed on said top surface of said mount substrate, said semiconductor chip carrying an air bridge structure on said bottom surface, said method comprising a steps of:

20 forming said depression by an etching process to said top surface of said mount substrate; and mounting said semiconductor chip on said mount substrate such that said air bridge structure is accommodated into said depression.

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1 14. A method as claimed in claim 13, wherein
said mount substrate is formed of Si, and wherein said
etching step includes an anisotropic wet etching process
applied to said top surface of said mount substrate.

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10 15. A method as claimed in claim 13, wherein
said mount substrate is formed of polyimide, and wherein
said etching step includes a dry etching process applied
to said top surface of said mount substrate.

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